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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/980,606	11/15/2001	Manabu Yamada	45923/DBP	8168

7590 05/19/2005

Bruce Prout
Christie Parker & Hale
Suite 500
350 West Colorado Boulevard
Pasadena, CA 91105

EXAMINER	
CHIEM, DINH D	

ART UNIT	PAPER NUMBER
2883	

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/980,606	YAMADA ET AL.	
	Examiner	Art Unit	
	Erin D. Chiem	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *4/13/05*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/980606.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/15/01; 11/06/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species I, claims 1-11, and 44 in the reply filed on April 13, 2005 is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: Claim 1 defines the "reinforcing capillary" as a "groove" or "hole", however, claim 4 furthers define the "reinforcing capillary" as a "cylinder" which is geometrically contradictory to claim 1. Therefore, claim 4 fails to further define claim 2, dependent on claim 1; claim 4 fails to structurally define how a hole or a groove is capable of being a cylinder.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 8, 10, 11 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Vaerewyck (US 4,768,848). An optical waveguide modulator equipped with an output light

monitor comprising, referring to Fig. 1, an optical waveguide element comprising a dielectric substrate 12 preferably made of $LiNbO_3$ (col. 3, line 37) and an optical waveguide formed on a front surface of the dielectric substrate 14 comprising a plurality of surface optical waveguide portions, and optical waveguide connecting portion on which the surface optical waveguide portions light-outputting portions are converged and connected to each other and an output light-outputting optical waveguide portion connected to the optical waveguide-connection portion 18;

6. an optical fiber for output light 54, connected to an output end of the output light-outputting optical waveguide portion of the optical waveguide element;

7. a reinforcing capillary for reinforcing a connection between the optical waveguide element and the output light-outputting optical fiber 30; and

8. a means for receiving monitoring light 58, wherein the reinforcing capillary is provided with a hold or groove formed on the surface for containing and holding the optical fiber for output light, a connection surface thereof connected to an output end side surface of the substrate of the optical waveguide element 28, and a terminal surface 29 thereof opposite to the connection surface, to thereby enable the reinforcing capillary to receive the monitoring light outputted from the optical waveguide element through at least one member selected from the capillary itself and the optical fiber for the monitoring light located in the capillary, to transmit the monitoring light therethrough and to output the monitoring light to the outside of the capillary; and

9. the monitoring light-receiving means is located in a position in which the monitoring light output from the reinforcing capillary to the outside of the capillary can be received, and is provided with a photoelectric conversion element (col. 3, line 3-5).

10. Regarding claim 4, the terminal end of the reinforcing capillary is polished and further applied with an epoxy having an index of refraction between glass and lithium niobate to reflect and contain the optical signal within to improve optical coupling efficiency (col. 4, line 29-37).

11. Regarding claim 6, the capillary 56 is coupled or branched off from the optical fiber waveguide 18 at an oblique angle.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claim 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaerewyck in view of Isono et al. (US 5,259,044).

14. Vaerewyck teaches an optical modulator formed on a dielectric surface, lithium niobate capable of transmitting light, having a Mach-Zehnder modulator formed on the front surface and the input/output of the Mach-Zehnder modulator is butt coupled to input/output optical fibers, each of which is held within a groove that is formed by ion milling. Furthermore, the optical modulator comprises reinforcing capillary that is coupled to a photodetector. However, Vaerewyck do not disclose the output optical signal is converged by a lens effect of the periphery of the cylindrical reinforcing capillary.

15. Isono et al. teach a Mach-Zehnder optical modulator with monitoring function of output light having lenses 47, 48 for converging the output signal for the purpose of coupling the output optical signal into a single mode optical fiber such as the one taught by Vaerewyck (Fig. 1, 22).

Regarding claim 9, wherein the output signal is output signal is coupled by a fiber having rounded end face. It is obvious that by rounding off the end face of an optical fiber will essential create a collimator such as a lens, wherein the optical signals is converged at one point.

16. Since Vaerewyck and Isono et al. are both from the same field of endeavor, the purpose disclosed by Isono et al. would have been recognized in the pertinent art of Vaerewyck.

17. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to couple refracted light traveling along the waveguide to converge to one radiation mode for the coherency of the optical signal to travel through a single mode optical fiber. By converging the refracted optical signal to one point, the coupling of the monitored optical signal is more efficiently coupled into a single mode fiber for further transmission.

18. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vaerewyck in view of Isono et al. as applied to claims 1-11 above, and further in view of Corsini et al. (US 5,796,764).

19. Vaerewyck and Isono et al. in combination teach a Mach Zehnder optical modulator with monitoring function of the output light. Both optical modulators are formed on a planar integrated eletro-optic circuit. However, Vaerewyck and Isono et al. do not explicitly disclose having a silicon oxide layer formed on a portion of the optical waveguide, mainly where the portions of the waveguides split and join to form the Mach Zehnder optical modulator. Corsini et al. teach a rare-earth doped lithium niobate laser having an antireflective film made of alternating layers of silicon oxide and titanium oxide applied to a polished end face of a lithium niobate crystal. (col. 7, line 27-32). The purpose of forming an antireflective film is to minimize reflection when two optically conductive materials are coupled together.

20. Since Vaerewyck, Isono et al. and Corsini et al. are all from the same field of endeavor, the purpose disclosed by Corsini et al. would have been recognized in the pertinent art of Vaerewyck and Isono et al.

21. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to alternately dope the end face of a polished lithium niobate crystal with titanium oxide and silicon oxide to form an antireflective layer for coupling two different light transmissive materials such that backreflection does not occur.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin D. Chiem whose telephone number is (571) 272-3102. The examiner can normally be reached on Monday - Thursday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Erin D Chiem
Examiner
Art Unit 2883

Frank G. Font
Supervisory Primary Examiner
Technology 2800